In respect to the examiner's objection to the specification on page 1, applicant has amended the areas in a matter that applicant believes adds the required degree of clarity to the recitation.

In respect to the examiner's rejection to claims 7 and 34-35, applicant has modified claims 7 and 34 in order to provide an antecedent basis for the respective recitations.

In respect to the examiner's objections based on Pringle U.S. Patent 4,805,744, by itself or in combination with Kumagai U.S. Patent 5,701,976, and/or Naumann U.S. Patent 6,302,246, applicant believes that the teachings of these references in different than the invention as taught in the present application.

The basic teaching of the cited Pringle reference is the use of a spring biased pressure accumulator (actuator 32) in order to selectively pressurize the main service brake (first hydraulic actuator 30) so as to use a single set of friction disks 44 for both as a service brake and as a parking brake (see fig 2 and explanation for example col 6 lns 1-30 therein). This use of an accumulator 32 allows the main brake pack to be utilized as a parking brake in the absence of externally pressurized fluid. For example, in figure 2 with the valves 114, 108 being in their disclosed position, fluid is stagnant. However, upon movement of the valve 108 to the left, the actuator 3o will be pressurized thus causing the device to operate as a service brake. On the other hand, if the valve 114 is moved to the left, the pressure from the first accumulator mechanism 32 will

be applied to the mechanism 30, thus to cause the disk 42, 44 to be applied again with the device functioning as a parking brake. This Pringle reference thus uses separate pressure accumulator circuit in order to manipulate the service brake to be a parking brake (replacing the more typical piston type accumulator as in col 1 lns 28-31; col 6 lns 1-29).

Pringle teaches of the engagement of first disk 44 and second disk 46 to prevent the rotation of a rotable portion 18 in respect to the fixed stationary portion 16 (col 2 lns 52-65). The device accomplishes this through the use of a first actuator means 30 (col 3 ln 16) and a second hydraulic actuator means 32 (col 4 ln 54). As configured hydraulically as shown in figure 2, upon the application of pressurization of line 60 to the first actuator, the service brake 28 brings the disks 44, 46 together thereby preventing the rotation of the rotable portion 18 (col 2 lns 55-68). During this time, there is a build up of pressurization in the second actuator 32 (col 3 lns 1-13). Upon selectively connecting this second actuator 32 circuit back to the line 60 of the service brake, the service brake then functions as a fluidically operated parking brake (col 1 lns 40-44; col 5 ln 46-col 6 ln 29). The biasing spring 94 stores pressure or force in actuator 32 (col 4 lns 59-640. This device thus uses the same friction brake 28 as a service brake and as a parking brake.

In respect to the rejections of claims 9-31, applicant believes that these claims as presently written distinguish over the

spring powered accumulator which would be utilized to apply the service brake in Pringle.

However, at the same time, applicant believes that modification of the recitation in these claims relative to a single spring, most pertinently that the single spring is in "physical contact with both said housing and said piston" it would distinguish over the pressure accumulator 32 that is utilized in Pringle. This allows for applicant to directly manipulate the brake pack 70 while at the same time being spaced from both the piston and interleaved disks.

It is believed that this additional recitation would be acceptable to applicant while also distinguishing the aforementioned series of claims from the rather complicated pressure accumulator in Pringle.

In respect to remaining independent claim 1, applicant has modified this claim to capture the direct actuation of the spring to disk as in the preferred embodiment of applicant's invention. This direct connection allows for a reliable physical movement of a spring to move such disk. This eliminates the complicated hydraulic valves and pipes of a pressure device such as Pringle.

Favorable action is solicited.

Respectfully submitted,

William Lightbody

William S. Lightbody (29,557)

A P P E N D I X

In the specification:

Page 1, third paragraph:

Certain of these selectively engageable friction mechanisms include interleaved pairs of disks, each pair connected to differing parts thereof. For example in a transmission, the interleaved pairs of disks might connect a ring gear to the transmission case for a sun gear input (or output) drive and a planet carrier output (or input) drive in an automatic transmission. Additional example would be to utilize the selective of the engagement of the interleaved disks to connect an input shaft to co-axial output shaft in a clutch device. Further example using the interleaved disks to connect a shaft to its housing to create a brake. Typically these mechanisms included concentric sintered rings of a friction substance on steel for the disks. This additional substance significantly increases the depth of each disk, as well as the overall length of any device incorporating same therebecause.

Page 19, first paragraph:

In the preferred embodiment disclosed, the disks are 4.0 inches in diameter and .082 inches thick and is constructed

of T6 aluminum anodic hard anodized coating to Mil-Spec Mil-A-8625 type III class 1 or equivalent spec to a thickness on each side of .002 +/- .001 with the majority of the saturation of the anodic hard anodized coating .001. The contents of this Mil-Spec is incorporated by reference. The inner edge is grooved to match outer ridges on the shaft 40 thereby to connect to same for common rotation. The specific coating employed by the preferred alternate coating embodiment described is Keronite registered by Isle Coat Ltd., UK. This coating is a complex oxide ceramic produced by surface oxidation electrolysis on the aluminum.

In the claims

Claim 1. A selectively engageable friction mechanism comprising two parts and a housing, one of which two parts is rotatable in respect to the other and the housing,

at least two friction disks, one of said two friction disks being non-rotatively connected to one of the two parts, the other of said two friction disks being non-rotatively connected to the other of the two parts, said one of said two friction disks having a single cross-section, said one of said two friction disks having a surface, said surface being hardened,

a spring to bias said one of said two friction disks in respect to said other of said friction disks, said spring

being in direct contact with said one of said two friction disks,

and engagement means to engage said one with said other of said two friction disks so as to connect the two parts.

Claim 2. The selectively engageable friction mechanism of claim 1 characterized by the addition of attachment means to non-rotatively connect said one or said other part to the housing such that said engagement means functions as a brake for said other or said one part respectively.

Claim 3. The selectively engageable friction mechanism of claim 1 characterized in that both of the two parts are rotatively connected to the housing such that said engagement means functions as a clutch between the two parts.

Claim 4. The selectively engageable friction mechanism of claim 1 wherein the mechanism includes a planetary device having a sun gear, planet gears with a carrier and a ring gear characterized in that a part of the two parts coincides with a gear or carrier of the planetary device.

Claim 5. The mechanism of claim 4 characterized in that said one and said other of the two parts coincides with a gear or carrier of the planetary device.

Claim 6. The mechanism of claim 1 characterized in that there are five or more friction disks.

Claim 7. The mechanism of claim 1 characterized in that said surface has a thickness and is hard anodized and 35-65% of said thickness of said hard anodizing is saturated within said surface.

Claim 8. The mechanism of claim 1 characterized in that said surface is coated by a complex oxide ceramic.

Claim 9. A selectively engageable friction mechanism comprising two parts and a housing, one of which is rotatable in respect to the other and the housing,

at least two friction disks, one of said two friction disks being non-rotatively connected to one of the two parts, the other of said two friction disks being non-rotatively connected to the other of the two parts, said one of said two friction disks having a single cross-section, said one of said two friction disks having a surface,

said surface being hardened and engagement means to engage said one with said other of said two friction disks so as to connect the two parts,

said engagement means includes a piston, said piston being located in a cavity, said cavity being located in the housing adjacent to said friction disks,

said piston having actuated and non-actuated positions relative to said friction disks;

a bias assembly, said bias assembly engaging both said piston and said housing and including a single spring, said single spring being in physical contact with both said housing and said piston,

said bias assembly biasing said piston into either of said actuated or non-actuated positions; and

a pressurization means, said pressurization means moving said piston into the other of said actuated or non-actuated positions.

Claim 10. A mechanism of claim 9 characterized in that said spring has an inner edge and an outer edge, said inner edge contacting either of said piston or said housing, and said outer edge contacting the other of said piston or said housing.

Claim 11. A mechanism of claim 10 characterized in that the spring is a belleville spring.

Claim 12. A mechanism of claim 9 characterized in that at least one washer is located intermediate between said spring and said housing.

Claim 13. A mechanism of claim 9 characterized in that said actuated position is synonymous with the brake being engaged.

Claim 14. A mechanism of claim 9 characterized in that said actuated position is synonymous with the brake being disengaged.

Claim 15. A mechanism of claim 7 characterized in that said surface is composed of an anodized metal, such metal preferably being aluminum.

Claim 16. A selectively engageable friction mechanism comprising a shaft and a housing, said shaft being selectably rotatable in respect to said housing;

a multiplicity of friction disks, said friction disks being non-rotatably connected to said shaft, said friction

disks having an engagement surface, said engagement surface having a single cross section;

a multiplicity of reaction disks, said reaction disks being non-rotatably connected to said housing, said friction disks being interleaved with said reaction disks;

a piston, said piston being located in a cavity, said cavity being located in said housing adjacent to one of said friction or said reaction disks, said piston having actuated and non-actuated positions relative to said one of said disks;

a bias assembly, said bias assembly engaging both said piston and said housing and including a single spring, said single spring being in physical contact with both said housing and said piston,

said spring of said bias assembly biasing said piston into either of said actuated or non-actuated positions; and

a pressurization means, said pressurization means moving said piston into the other of said actuated or non-actuated positions.

Claim 17. A mechanism of claim 16 characterized in that said spring has an inner edge and an outer edge, said inner edge contacting either of said piston or said housing, and said outer edge contacting the other of said piston or said housing.

Claim 18. A mechanism of claim 17 characterized in that the spring is a belleville spring.

Claim 19. A mechanism of claim 16 characterized in that at least one washer is located intermediate between said spring and said housing.

Claim 20. A mechanism of claim 16 characterized in that said actuated position is synonymous with the brake being engaged.

Claim 21. A mechanism of claim 16 characterized in that said actuated position is synonymous with the brake being disengaged.

Claim 22. A mechanism of claim 16 characterized in that said friction disks are composed of an anodized metal, such metal preferably being aluminum.

Claim 23. A mechanism of claim 22 characterized in that said friction disks are covered with Keronite.

Claim 24. A mechanism of claim 16 characterized in that said shaft is interconnected to a drive mechanism.

Claim 25. A selectively engageable friction mechanism comprising a shaft and a housing, said shaft being selectably rotatable in respect to said housing;

a multiplicity of friction disks, said friction disks being non-rotatably connected to said shaft, said friction disks being composed of an anodized metal and having an engagement surface, said engagement surface having a single cross section;

a multiplicity of reaction disks, said reaction disks being non-rotatably connected to said housing, and said friction disks being interleaved with said reaction disks;

a piston, said piston being located in a cavity, said cavity being located in said housing adjacent to one of said friction or said reaction disks, said piston having actuated and non-actuated positions relative to said one of said disks;

at least two seals, said seals being located in said piston and contacting said housing so as to provide at least one pressurizable chamber within said cavity;

a means of selectably pressurizing said at least one chamber said means allowing movement of said piston into either of said actuated or non-actuated positions;

a bias assembly, said bias assembly engaging both said piston and said housing and including a single spring; said single spring being in physical contact with both said housing and said piston,

said spring having an inner edge and an outer edge, said inner edge being radially displaced from said outer edge, said inner edge of said piston physically contacting either of said piston or said housing, and said outer edge of said spring physically contacting the other of said piston or said housing; and

said bias assembly biasing said piston into the other of said actuated or non-actuated positions.

Claim 26. A mechanism of claim 25 characterized in that at least one washer is located intermediate between said spring and said housing.

Claim 27. A mechanism of claim 25 characterized in that said actuated position is synonymous with the brake being engaged.

Claim 28. A mechanism of claim 25 characterized in that said actuated position is synonymous with the brake being disengaged.

Claim 29. A mechanism of claim 25 characterized in that said friction disks are preferably aluminum.

Claim 30. A mechanism of claim 25 characterized in that said friction disks are covered with Keronite.

Claim 31. A mechanism of claim 25 characterized in that said shaft is interconnected to a drive mechanism.

Claim 32. A selectively engageable friction mechanism comprising a shaft and a housing, said shaft being selectably rotatable in respect to said housing;

a multiplicity of friction disks, said friction disks being non-rotatably connected to said shaft, said friction disks being composed of an anodized metal and having an engagement surface, said engagement surface having a single cross section;

a multiplicity of reaction disks, said reaction disks being non-rotatably connected to said housing, there being an equal number of said friction disks and said reaction disks, said friction disks being interleaved with said reaction disks;

a piston, said piston being located in a cavity, said cavity being located in said housing adjacent to said reaction disks, said piston having actuated and non-actuated positions relative to said reaction disks;

three seals, said seals being located in said piston and contacting said housing so as to provide two pressurizable chambers within said cavity;

a means of selectably pressurizing at least one of said chambers, the pressurization of either of said chambers allowing movement of said piston into either of said actuated or non-actuated positions;

a bias assembly, said bias assembly engaging both said piston and said housing and including a single spring; said single spring being in physical contact with both said housing and said piston,

said spring having an inner edge and an outer edge, said inner edge being radially displaced from said outer edge, said inner edge physically contacting either of said piston or said housing, and said outer edge physically contacting the other of said piston or said housing; and

at least one washer, said washer being located between said spring and said housing.

Claim 33. In a selectably engageable mechanism having a shaft and a bearing, there being a movable part surrounding the shaft, the improvement means for the movable part to contact the bearing to provide a bearing stop.

Claim 34. In a selectively engageable mechanism having a shaft with a bearing, the bearing having an inner race, and the improvement of the inner race of the bearing being coextensive with the shaft.

Claim 35. In a selectively engageable mechanism between a shaft and another part, the improvement comprising a device.

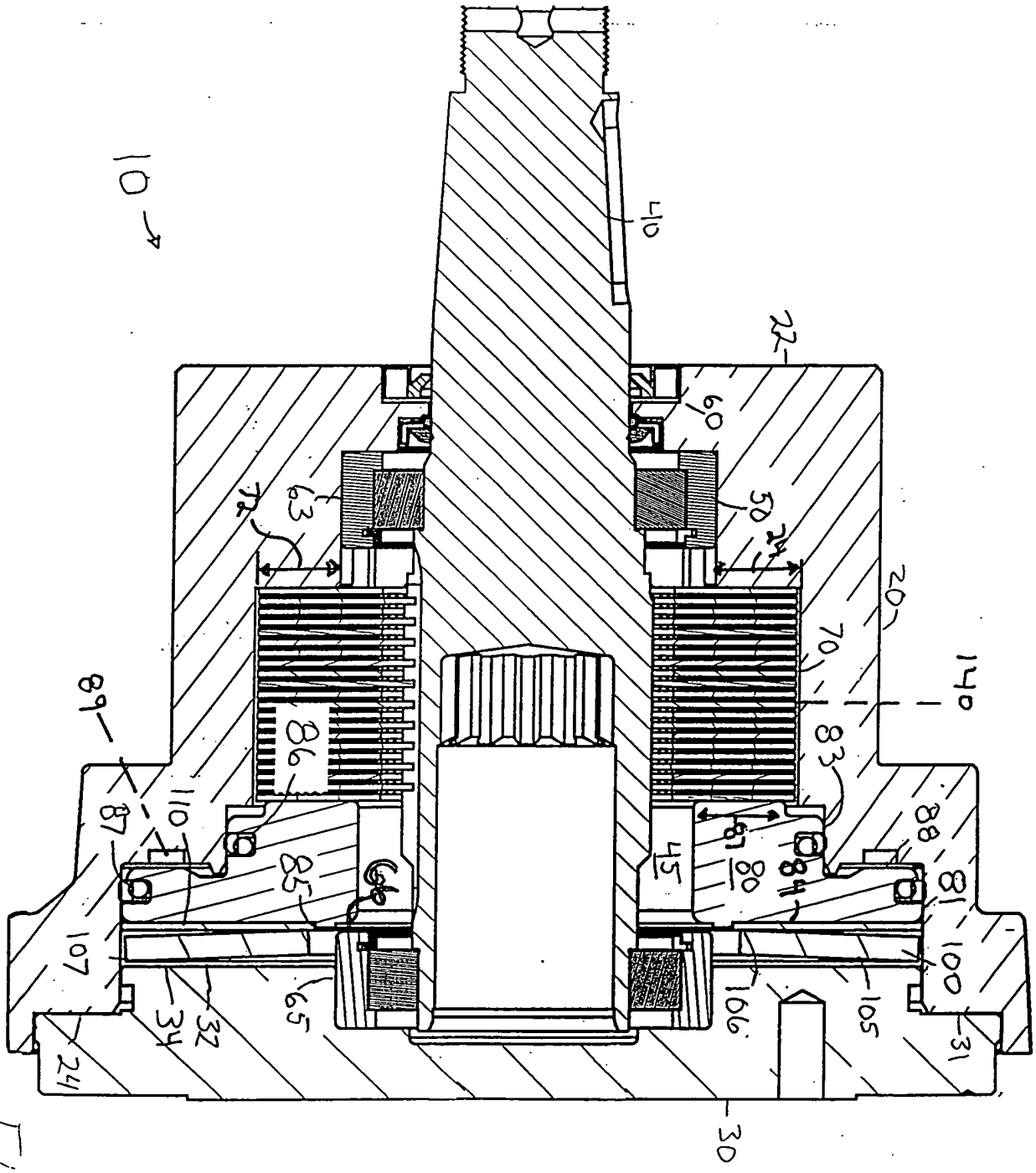

FIG. 4

approved
DJR
11-11-03